

Supplementary Table 1a. Baseline demographics, clinical and psychological features of patients with constipation undergoing abbreviated versus standard biofeedback (BF) protocol

	Abbreviated BF protocol N=18	Standard BF protocol N=36	Difference between groups ^a (95% CI)	P value
Age; years, mean (SD)	47 (14)	46 (14)	-0.5 (-1.5 – 0.3)	NS
Gender; females; n (%)	16 (89%)	32 (89%)		NS
Multiparous; n (%)	11 (69%)	22 (69%)		NS
Duration of bowel symptoms; years, mean (SD)	13 (12)	15 (13)	+2 (-4 – 9)	NS
Constipation score, mean (SD)	17.1 (5.1)	17.5 (4.6)	+ 0.4 (-2.2 – 2.9)	NS
Effect of bowel dysfunction on quality of life; mean (SD) ^b	8.4 (1.4)	6.8 (2.3)	-1.6 (-2.7 – 0.5)	0.005
Patients satisfaction with bowel movements; mean (SD) ^c	3.1 (2.6)	2.7 (2.3)	-0.4 (-1.9 – 1.2)	NS
Control over bowel movements; mean (SD) ^c	3.8 (2.8)	3.1 (2.1)	-0.7 (-2.5 – 1.2)	NS
Willingness to complete anorectal biofeedback; mean (SD) ^b	9.8 (0.5)	9.5 (1.0)	-0.3 (-0.7 – 0.2)	NS
SF-36 Physical functioning (0-100); mean (SD)	53 (40)	60 (31)	+ 7 (-12 – 29)	NS
SF-36 Role- physical (0-100); mean (SD)	48 (41)	60 (45)	+ 11 (-14 – 37)	NS
SF-36 Pain index (0-100); mean(SD)	58 (27)	61 (26)	+3 (-14 – 20)	NS
SF-36 Vitality (0-100); mean(SD)	45 (25)	41 (22)	-4 (-18 – 11)	NS
SF-36 Role-emotional (0-100); mean (SD)	64 (46)	76 (35)	+ 12 (-12 – 36)	NS
SF-36 Mental health index (0-100); mean (SD)	69 (27)	65 (22)	-5 (-17 – 7)	NS
HAD anxiety score; mean (SD)	5.3 (2.8)	6.2 (2.5)	+ 0.9 (-0.7 – 2.5)	NS
HAD depression score; mean (SD)	6.7 (4.0)	7.2 (3.9)	+ 0.6 (-1.8 – 2.9)	NS

^a Using abbreviated BF as reference.

^b Using visual analogue scale (0 to 10), with higher scores indicating worse severity

^c Using visual analogue scale (0 to 10), with lower scores indicating worse severity

Supplementary Table 1b. Baseline demographics, clinical and psychological features of patients with fecal incontinence undergoing abbreviated versus standard biofeedback (BF) protocol

	Abbreviated BF protocol N=13	Standard BF protocol N=26	Difference between groups ^a (95% CI)	P value
Age; years, mean (SD)	64 (11)	63 (10)	-0.3 (-0.9 - 0.4)	NS
Gender; females; n (%)	13 (100%)	26 (100%)		NS
Multiparous; n (%)	24 (92%)	13 (100%)		NS
Duration of bowel symptoms; years, mean (SD)	5.4 (3.8)	5.8 (5.8)	+ 0.4 (-2.5 – 3.4)	NS
Fecal Incontinence Severity Index; mean (SD)	27 (11)	21 (8)	-6 (-11 - -0.5)	0.03
Effect of bowel dysfunction on quality of life; mean (SD) ^b	6.3 (3.3)	5.2 (2.4)	-1.1 (-3.3 – 1.1)	NS
Patients satisfaction with bowel movements; mean (SD) ^c	2.7 (1.8)	4.3 (2.4)	+1.6 (0.8 – 2.5)	<0.001
Control over bowel movements; mean (SD) ^c	2.7 (2.2)	3.9 (2.4)	+1.3 (0.1 – 2.5)	0.04
Willingness to complete anorectal biofeedback; mean (SD) ^b	9.9 (0.4)	9.6 (0.7)	-0.2 (-0.6 – 0.2)	NS
SF-36 Physical functioning (0-100); mean (SD)	54 (28)	69 (23)	+ 15 (3 - 28)	0.02
SF-36 Role- physical (0-100); mean (SD)	46 (45)	76 (31)	+30 (6 – 54)	0.01
SF-36 Pain index (0-100); mean(SD)	66 (39)	80 (22)	+14 (-8 – 36)	NS
SF-36 Vitality (0-100); mean(SD)	48 (30)	57 (17)	+9 (-8 – 26)	NS
SF-36 Role-emotional (0-100); mean (SD)	67 (45)	77 (39)	+ 10 (-19 – 39)	NS
SF-36 Mental health index (0-100); mean (SD)	73 (18)	70 (21)	-3 (-17 – 12)	NS
HAD anxiety score; mean (SD)	5.3 (1.9)	5.7 (2.6)	+0.4 (-1.2 – 2.0)	NS
HAD depression score; mean (SD)	8.0 (4.2)	5.8 (3.9)	-2.2 (-5.1 – 0.74)	NS

^a Using abbreviated BF as reference.

^b Using visual analogue scale (0 to 10), with higher scores indicating worse severity

^c Using visual analogue scale (0 to 10), with lower scores indicating worse severity

Supplementary Table 2a. Baseline physiology of patients with constipation undergoing the abbreviated versus standard biofeedback (BF) protocol.

	Abbreviated BF protocol N=18	Standard BF protocol N=36	Difference or odds ratio (OR) ^a (95% CI)	P value
Maximal anal resting pressure; mmHg, mean (SD)	76 (18)	75 (27)	-1 (-14 – 13)	NS
Maximal anal squeeze pressure ; mmHg, mean (SD)	161 (43)	152 (44)	-9 (-35 – 16)	NS
Duration of sustained anal squeeze; seconds, mean (SD)	24 (7)	25 (8)	+ 1 (-4 – 7)	NS
Unable to hold sustained squeeze >20 seconds; n (%)	5 (28%)	5 (14%)	0.4 (0.1 – 2.2)	NS
Rectal pressure on strain; mmHg, mean (SD)	57 (25)	54 (24)	-3 (-11 – 5)	NS
Inadequate (<45 mmHg) rectal pressure on strain; n (%)	12 (67%)	20 (56%)	0.6 (0.2 – 1.8)	NS
Anal relaxation on strain absent; n (%)	15 (83%)	34 (94%)	3.4 (0.4-26)	NS
Un-successful (>60 sec) balloon expulsion; n (%)	8 (44%)	15 (42%)	0.9 (0.2-3.3)	NS
Mean time to balloon expulsion; seconds, mean (SD)	72 (73)	74 (71)	+2 (-41 – 45)	NS
First sensation threshold; ml, mean (SD)	56 (42)	85 (60)	+29 (5 – 52)	0.02
Defecation urge threshold ; ml, mean (SD)	126 (54)	152 (78)	+26 (-8 – 60)	NS
Maximal tolerated threshold ; ml, mean (SD)	215 (64)	220 (70)	+5 (-32 – 42)	NS

^a Using abbreviated BF as reference.

Supplementary Table 2b. Baseline physiology of patients with fecal incontinence undergoing the abbreviated versus standard biofeedback (BF) protocol.

	Abbreviated BF protocol N=13	Standard BF protocol N=26	Difference or odds ratio (OR) ^a (95% CI)	P value
Maximal anal resting pressure; mmHg, mean (SD)	49 (15)	47 (13)	-2.3 (-13.4 – 8.9)	NS
Maximal anal squeeze pressure ; mmHg, mean (SD)	103 (41)	103 (34)	-0.3 (-25 – 25)	NS
Duration of sustained anal squeeze; seconds, mean (SD)	23 (6)	25 (8)	+2 (-2 – 7)	NS
Unable to hold sustained squeeze >20 seconds; n (%)	5 (38%)	5 (19%)	0.4 (0.1 – 1.6)	NS
Rectal pressure on strain; mmHg, mean (SD)	64 (39)	59 (17)	-5 (-25 – 15)	NS
Inadequate (<45 mmHg) rectal pressure on strain; n (%)	7 (54%)	19 (73%)	2.3 (0.8–7.0)	NS
Anal relaxation on strain absent; n (%)	11 (85%)	22 (85%)	1 (0.2–5.5)	NS
Un-successful (>60 sec) balloon expulsion; n (%)	1 (8%)	1 (4%)	1	NS
Mean time to balloon expulsion; seconds, mean (SD)	8 (6)	20 (37)	+12 (-1 - 25)	NS
First sensation threshold; ml, mean (SD)	40 (11)	53 (29)	+13 (2 – 23)	0.02
Defecation urge threshold ; ml, mean (SD)	85 (17)	112 (64)	+27 (2- 52)	0.04
Maximal tolerated threshold ; ml, mean (SD)	141 (34)	173 (74)	+32 (1 – 63)	0.04

^a Using abbreviated BF as reference.

Supplementary Table 3a. Changes in anorectal physiology of constipated patients undergoing abbreviated biofeedback (BF) compared to patients undergoing standard BF protocol

	Abbreviated BF protocol				Standard BF protocol				P value for difference in change
	Before BF N=18	After BF N=17	Change before vs. after BF	P value	Before BF N=36	After BF N=34	Change before vs. after BF	P value	
	Mean (SD)				Mean (SD)				
Maximal anal resting pressure; mmHg	76 (18)	73 (34)	0 (29)	NS	75 (27)	75 (22)	+2 (21)	NS	NS
Maximal anal squeeze pressure; mmHg	161 (43)	159 (38)	-3(18)	NS	152 (44)	164 (40)	+4 (31)	NS	NS
Sustained squeeze duration; seconds	24 (7)	30 (11)	+7 (12)	0.04	25 (8)	24 (6)	-1 (9)	NS	0.02
Rectal pressure on strain; mmHg	57 (25)	53 (11)	-4 (24)	NS	54 (24)	53 (21)	-1 (28)	NS	NS
First sensation threshold; ml	56 (42)	44 (15)	-13 (43)	NS	85 (60)	43 (22)	-34 (51)	0.01	0.01
Defecation urge threshold; ml	126 (54)	131 (55)	+ 5(45)	NS	152 (78)	126 (47)	-23 (57)	NS	NS
Maximal tolerated threshold; ml	215 (64)	204 (57)	-10 (49)	NS	220 (64)	184 (54)	-23 (46)	NS	NS

Supplementary Table 3b. Changes in anorectal physiology of fecal incontinent patients undergoing abbreviated biofeedback (BF) compared to patients undergoing standard BF protocol

	Abbreviated BF protocol				Standard BF protocol				P value for difference in change
	Before BF N=13	After BF N=10	Change before vs. after BF	P value	Before BF N=26	After BF N=25	Change before vs. after BF	P value	
	Mean (SD)				Mean (SD)				
Maximal anal resting pressure; mmHg	49 (15)	49 (11)	-4 (19)	NS	47 (13)	49 (12)	+4 (15)	NS	NS
Maximal anal squeeze pressure; mmHg	103 (41)	128 (38)	+22 (28)	0.047	103 (34)	110 (42)	+8 (40)	NS	NS
Sustained squeeze duration; seconds	23 (6)	37 (18)	+16 (22)	0.052	25 (8)	32 (11)	+6 (16)	NS	NS
Rectal pressure on strain; mmHg	64 (39)	52 (14)	-8 (26)	NS	59 (17)	45 (15)	-14 (14)	0.002	NS
First sensation threshold; ml	40 (11)	37 (7)	-0.1 (8)	NS	53 (29)	35 (12)	-20 (30)	0.03	<0.001
Defecation urge threshold; ml	85 (17)	103 (38)	+21 (30)	NS	112 (64)	90 (29)	-27 (67)	NS	0.007
Maximal tolerated threshold; ml	141 (34)	152 (49)	+16 (47)	NS	173 (74)	157 (54)	-17 (62)	NS	NS

Supplementary Table 4a. Change in outcome measures at the end of biofeedback (BF) compared to before BF: abbreviated BF versus standard BF protocol in constipated patients only

	Abbreviated BF; mean (SD)	P value for improvement	Standard BF; mean (SD)	P value for improvement	p-value for difference between improvements
	N=18		N=33		
Constipation score %	-23 (25)	0.01	-22 (37)	0.002	NS
Effect on quality of life % ^a	-29 (24)	0.01	-35 (32)	<0.001	NS
Satisfaction with bowel movements% ^b	+70 (65)	0.02	+243 (289)	<0.001	<0.001
Control over bowel function % ^b	+86 (100)	0.009	+204 (219)	<0.001	NS
Physician assessment of response to BF (significant-moderate improvement)	8/18 (44%)		20/33 (61%)		NS

^a Using visual analogue scale (0 to 10), with more negative values indicating greater improvement

^b Using visual analogue scale (0 to 10), with more positive values indicating greater improvement

Supplementary table 4b. Change in outcome measures at the end of biofeedback (BF) compared to before
BF: abbreviated BF versus standard BF protocol in fecal incontinent patients only

	Abbreviated BF; mean (SD) N=9	P value for improvement	Standard BF; mean (SD) N=25	P value for improvement	p-value for difference between improvements
Fecal incontinence severity index %	-42 (33)	0.01	-26 (75)	0.004	NS
Effect on quality of life % ^a	-32 (36)	0.04	-35 (65)	0.01	NS
Satisfaction with bowel movements% ^b	+ 116 (150)	NS	+141 (105)	0.0002	NS
Control over bowel function % ^b	+200 (218)	0.02	+204 (228)	0.0004	NS
Physician assessment of response to BF (significant-moderate improvement)	4/9 (44%)		23/25 (92%)		0.007

^a Using visual analogue scale (0 to 10), with more negative values indicating greater improvement

^b Using visual analogue scale (0 to 10), with more positive values indicating greater improvement